

Notice of Allowability

Application No.

09/886,855

Examiner

Satish S. Rampuria

Applicant(s)

PITSIANIS ET AL.

Art Unit

2191

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 8/21/2006.
2. ☒ The allowed claim(s) is/are 1-36.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☒ Interview Summary (PTO-413),
Paper No./Mail Date 10/25/06.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

DETAILED ACTION

This action is in response to the Appeal Brief filed on August 21, 2006.

Claims 1-36 are allowed.

Examiner's Amendment

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Peter H. Priest [Reg. No. 30,210] on Oct. 25, 2006.

In the claims

Please amend claims 16-17 and 34 as follows.

Claim 16,

At line 5, delete [and]

At line 10, delete [.] and add --; and--

At line 11, add --allocating at least some of the VLIW instructions to VLIW instruction memory based on said VLIW flow equation.--

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Claim 17,

At line 2, delete $[I_n = U_n \cup (O_n - D_{KNY})]$ and add -- $I_n = U_n \cup (O_n - D_n)$ --.

Claim 34,

At line 5, delete [and]

At line 10, delete [.] and add --; and--

At line 11, add --means for allocating at least some of the VLIW instructions to VLIW instruction memory based on said VLIW flow equation.--

--END--

Reasons for Allowance

The following is an examiner's statement of reasons for allowance:

As pointed out by the Appellant in the argument section that the cited prior art (Faraboschi et al. [5,930,508] and Roediger et al. [6,305,014]) taken alone or in combination fail to teach, in combination with the other claimed limitations, *determining a lifetime of each of said plurality of VLIW instructions, the lifetime of a VLIW instruction including the interval of time between loading the VLIW instruction to VIM and the last time the VLIW instruction is executed; and allocating at least some of the plurality of VLIW instructions to VIM based on the lifetime of said plurality of VLIW instructions* as recited in the independent claims 1 and 19.

As pointed out by the Appellant in the argument section that the cited prior art (Faraboschi et al. [5,930,508] and Roediger et al. [6,305,014]) taken alone or in combination fail to teach, in combination with the other claimed limitations, *selecting a load VLIW (LV) instruction in a current node; and placing the LV instruction in a new node which is closer to a program start*

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node if an execution frequency of the new node is lower than an execution frequency of the current node, and if a maximum number of VIM lines is not exceeded as recited in the independent claims 15 and 33.

As pointed out by the Appellant in the argument section that the cited prior art (McKinsey et al. [6,675,380], Faraboschi, and Chaitin) taken alone or in combination fail to teach, in combination with the other claimed limitations, *determining an interference graph from the VLIW flow graph, the interference graph comprising VLIW nodes in which every VLIW node of the interference graph corresponds to one VLIW instruction; inserting an undirected edge into the interference graph between two VLIW nodes if the two VLIW instructions belong to a live-out set of the same node of the VLIW flow graph; and coloring the VLIW graph nodes such that adjacent VLIW nodes are colored in different colors and each color corresponds to a different VIM line as recited in the independent claims 18 and 36.*

As pointed out by the Appellant in the argument section that the cited prior art (McKinsey et al. [6,675,380] and Faraboschi) taken alone or in combination fail to teach, in combination with the other claimed limitations, *determining a control flow graph which includes nodes representing basic program blocks, and edges connecting the nodes which represent jumps and calls from one block to another block; determining a live-in set and a live-out set of VLIW instructions for each node in the control graph to define a VLIW flow graph, a live-in set for a node comprises the VLIW instructions that are used in the node, a live-out set for a node comprises a union of live-in sets of successor nodes, the determining step further including solving VLIW flow equations for the live-in set and the live-out set; and allocating at least some*

of the VLIW instructions to VLIW instruction memory based on said VLIW flow equation as recited in the independent claims 16 and 34.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Satish S. Rampuria whose telephone number is (571) 272-3732. The examiner can normally be reached on 8:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wei Y. Zhen can be reached on (571) 272-3708. Any inquiry of a general nature or relating to the status of this application should be directed to the TC 2100 Group receptionist: 571-272-2100.


WEI ZHEN
SUPERVISORY PATENT EXAMINER

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Satish S. Rampuria
Patent Examiner/Software Engineer
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SUPERVISORY PATENT EXAMINER